

Still Alive With Sir Clive!

# ZXir QLive Alive!

The Timex/Sinclair North American User Groups Newsletter

Volume 9 No. 2

Summer '99

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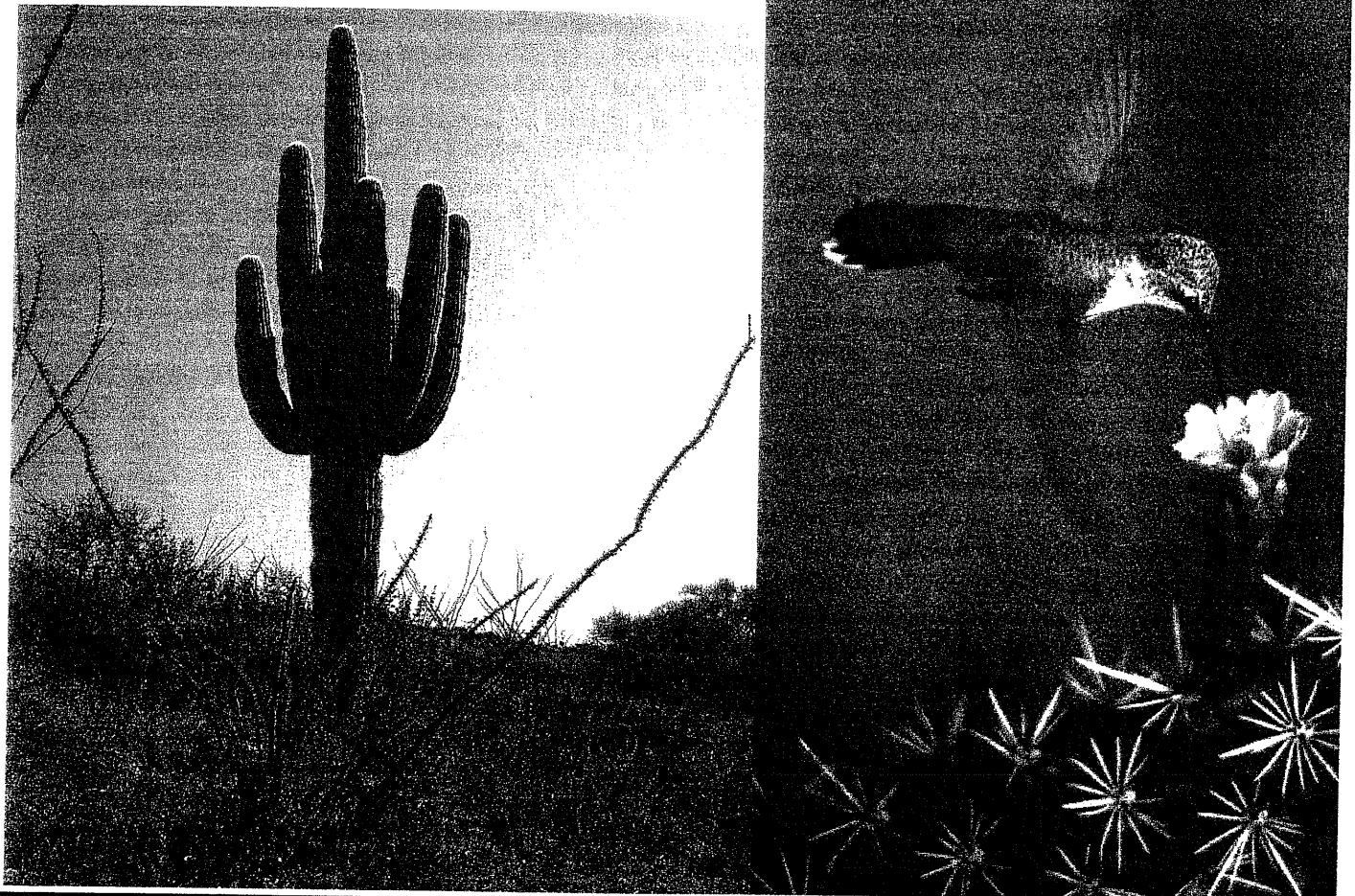
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# T/SNUG Information

We wish to support the following platforms : ZX-80/81, TS-1000, Spectrum, TS-2068, Z88 and QL. If you have any questions about any of these fine Sinclairs, contact the:

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Any of the above can also be reached by E-Mail through the  
**Club BBS 847 632-5558**

## ZXir QLive Alive!

Is the newsletter of T/SNUG, the Timex/Sinclair North American User Groups, providing news and software support to the T/S community in a **VOLUME** of four newsletters per year; beginning with the Spring (March) issue.

**T/SNUG's main goal is to preserve and encourage the use of Sinclair computers by providing an open forum for the exchange of knowledge, building and maintaining of software libraries. Providing vendors, repair service and members with free ad space.**

It is the user groups and individual subscribers, rather than the vendors, that provide the pecuniary support for this newsletter. Vendors and developers receive this newsletter free of charge, though contribution from vendors and user groups is gratefully accepted. Please support our vendors and service providers whenever possible.

If you have a problem or you have solved a problem, please share it with the rest of us. No problem will be considered unimportant.

## Editor/Treasurer Publisher

You can keep T/SNUG alive by an annual contribution of \$12 for one VOLUME made payable to Abed Kahale. Send check to -

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520 378-3424

**Back copies are available for \$1.00 each postpaid.**

## Trea\$ury Note\$

As of June 29, 1999, we have a balance of \$880.22

## Article Contributions

Send in your articles by disk, hardcopy or mail, e-mail and your inputs to:—

**Abed Kahale**

E-mail: AKahale@compuserve.com

# WELCOME

## Glen Goodwin

## GATOR'S

### Twisted Pair

To better inform the Sinclair Community, three 24-hour a day BBSs are now provided to serve you. You are encouraged to exchange mail and use the files sections of these boards. Bulletins and ads are available to all.

**Q-Box BBS 810 254-9878**

Utica, Michigan

**SOL BBS 520 882-0388**

Tucson, Arizona

**Club BBS 847 632-5558**

Arlington Heights, Illinois

### WebPages

<http://users.aol.clubbbs/tsnug/>

<http://www.outlawnet.com/~jboatno4>

If you know the Internet E-Mail address of a Sinclair user, but do not have access to Internet, simply address your E-Mail to GATOR Sinclair on the 24-hour Club BBS and include the name and E-Mail address of the user you wish to reach. Then check the Club BBS from time to time if you expect a reply.

We encourage you to exchange mail and contribute to the UPLOAD section. Call and register using your first, last name and phone number along with a password you won't forget. **Write It Down!** Do not try to do anything else at this time.

When you call-in the next time, you will have Level 5 security and be able to enjoy full user privileges. The BBS has smaller sections called conferences. Select "J" for "Join a Conference". Select "TIMEX" to get into the Sinclair Section. The mail you then read will only be from other T/S users. Use extension .ART for articles, .ADS for ads and .NWS for news when UPLOADing.

For help, contact the SYSOP, Bob Swoger, by leaving a message, mail, E-Mail or phone.

CENG108@email.mot.com

# Input/Output

by *Abed Kahale*

Hello Abed...

I was talking to Larry Kenny recently and he tells me that he is willing to release all his information on LarKen DDIs to the public domain. All he is asking for is a working Timex/Sinclair 2068 and the last version of his T/S 2068 DDI in return. (It seems that both were "lost" during a move.) This is very little to ask for this information and the possibility that a LarKen disk access could be built into one of the existing Sinclair emulators such as Gerton Lunter's Z80 emulator or the Warajevo emulator. (Much of my best T/S 2068 software is locked up on LarKen formatted diskettes as NMI saves that can not be accessed by any other means.)

Perhaps the best way for anyone who wishes to make an offer of either one would be to write Larry Kenny directly. His e-mail address is [larken@storm.ca](mailto:larken@storm.ca). Just remind him what the offer is in aid of. There is also a LarKen Electronics web site.

Also, for the benefit of those who subscribe to ZQA! but not to the list, you could put an announcement to this effect in the next publication.

**David Solly**

Hello Larry,

I just got a letter forwarded to me from T/SNUG by Abed Kahale from Dave Solly.

I am Bob Swoger, --==GATOR==-- of GATOR Software Development - the author of LogiCall for the LarKen Disk Interface on the TS2068.

Next time you are surfing the INTERNET check out:  
<http://members.aol.com/clubbbs/> (to see my picture - ugliest thing you'll ever see)

<http://members.aol.com/clubbbs/tsnug> (where all North American Sinclair happens)

<http://members.aol.com/clubbbs/catug> (our little Chicago Club)

Let me know what you think about our homepages ---

--==GATOR==--

Hello Abed...

Program listings are best done in a fixed pitch (or mono spaced) font like OCR-A or Courier. This is especially true of QL BASIC and Pascal where the indentation is an indication of program flow which is useful for debugging.

People should also be encouraged to use a font in which a 1 (one), does not look like an l (el), or a 0 (zero) does not look like an O (oh) and so on. It helps reduce the frustration levels of those who are trying to type in and run programs from listings.

I think, in the long run, this will also save you a lot of work as well as making ZXir QLive Alive! a consistently high quality newsletter. (Sometimes the paralinguistics don't come through in the written form of the language. I hope this is coming through as positive suggestions. :))

**David Solly**

Mr. Swoger:

I'm a recently revived ZX-81 user and happened to stumble onto the T/SNUG site. I noticed you have a page

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with many items for sale at very reasonable prices.

Whom should I contact about purchasing some of these items?

Also please forward T/SNUG membership information as I wish to support groups such as yours who keep the Sinclair line of computers alive. Regards,

**Glen Goodwin**

Hi Abed,

Here's another news article I found on the 'net about the next Sinclair machine.

**Jack Boatwright**

## Linux Tempts Sinclair Back Inventor Promises to Undercut PC Market With Linux Machine.

Inventor and entrepreneur Sir Clive Sinclair is planning a return to the IT market with a low-price portable machine based on Linux and non-Intel chips, writes Robert Juman Blincoe.

Sinclair believes the product will receive support from the corporate and academic markets because Linux has already secured great loyalty in these sectors.

He claims his proposed machine, which will take two years to come to market, will be built around a cheaper processor than Intel's.

"The standard PC is expensive because of Intel and the software, which is demanding of memory," Sinclair said. "The reason why my machine will be cheaper is that it will use a lot less memory, a lower-cost processor, a simpler power supply and a lower-cost operating system."

Sinclair says his new machine will be released at less than half the price of other similar-sized PCs on the market. He supports the loyal Linux users who want Windows to be unbundled from PCs.

"There should be one price for a machine with Microsoft and one price for a machine with Linux," he said.

"Linux looks like a way in - a Trojan horse," Sinclair continued; "a lot of software suppliers are now supporting it. They wouldn't do that if they didn't have a lot of confidence in it. I think a dedicated Linux machine will be the next step."

22 April 1999 Business Publications Ltd.

Dear Abed,

Peter Liebert-Adelt purchased some T/S magazines from me and because a couple of **CTM** mags were in those that I sent ... Peter asked if I could give him any "fill in" about them? Apparently they were devoted to computers and radios? I know nothing about the mag. I wondered if you (or perhaps, one of your readers) might be able to help Peter? Sinclairly,

**Fred Henn**

Dear Abed

I recently snail-mailed you a memo requesting a copy of DUS 5.0. I did get a copy and thank you for your help.

As you can see, I have finally made the jump to the

p.c. - windows system.

And as you can imagine I have far too many text files to consider printing and then re entering them into the windows format.

The question then is; Is there a dos/windows utility that will allow a p.c. to read TS2068 LarKen text files?

I do not plan to sell the TS2068, but for the sake of convenience would like to be able to read the LarKen diskettes with this p.c. Thank You

**Don Oviatt** c.d.oviatt@worldnet.att.net

As far as I know, the only way to read TS2068 files in a PC is through a modem, if you have a TS2050 modem that is.

One way is to UPLOAD a file from the 2068 to a BBS for instance and then DOWNLOAD that file by a PC.

Or connect the PC and the 2068 modems together and have one computer UPLOAD or DOWNLOAD to the other computer. A little flaky but I have done it in the past. But I will steer you to Robert Swoger (Chicago Area Timex User Group) clubbbs@aol.com

..... I also have some software items for TS2068 that I have gotten in recent purchases. **Profile 2068, Tasword 2** and some others. If you want a list I will try to get it before the next edition. I also have **TS2068 cartridges; Crazybugs and States Capitals.**

**Jack Boatwright**

Date: Thu, 3 Jun 1999 12:19:38 -0400 (EDT)

From: jl911@cleveland.freenet.Edu (Rod Gowen)

Subject: Thanks for ZQA!

Hello Abed,

Well, I am finally able to do email. I cannot send or receive attachments, but I can use the mail! I received the disk last week with the I/O file on it. I must say that it was in sorry condition. The metal slide cover was so bad that I had to remove it even to get it into a drive. I did manage to get it in, load the file and then I threw it away. Thank you for the file.

Now, however, you can put whatever you have in or can put into ASCII text format and send it to me as an email letter. It will save a lot of trouble on your part.

Jack Boatwright has been keeping me up to date until now. Now I am able to get on his site and jump to other TS pages from there. It is interesting. I do not use windows to do this. I am using a DOS program called Commo V7 and my local library has a Telnet connection to the internet. I can go anywhere and even download files, I just cannot attach things to the mail I send. That is one of the restrictions of the :freenet. concept.

Well, I will quit for now. Hope to hear from you when the new ZQA! is ready. Later,

**Rod Gowen**

*To Bob Swoger Larry Sauter  
Cy Herre John Donaldson  
and Phillip Kiwtkowski  
Thank you very much for the  
flowers sent to my wife's funeral.*

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## QL Today Notes

by Robert Hartung

The QL Today news notes which I send to the ZQA! Editor from time to time are obviously reports on reports and reviews that appear in recent issues of that Newsletter. I don't intend this to be like some of the "talking heads" on TV today who seem to be only reporting on the opinions of other reporters instead of researching the actual news sources. What I'm trying to say here is that I hope these brief reports on QL Today news items will stir up interest among some QL users so they will want to "go to the source" and subscribe to QL Today themselves. It should go without saying that only if there is continued support for those who are supplying information, hardware, software, and services will these things continue to be available, here, as well as overseas.

One factor some state as a reason/excuse for not buying their own subscription to QL Today (presently DM75 or £30) is the difficulty of converting currencies -- no problem when plastic is used. The first of the year marked the introduction of the Euro dollar -- sort of. For a time it will be used only for electronic transfers and exchanges, not as actual currency. Also, for the time being the UK has opted out of participation with the eleven members of the European community who are on board, so the British pound is still "the coin of the realm" in all transactions made there. Apparently, all this is giving headaches among European QL users as well as those here in making currency conversions, so an Italian users group has created a neat little QLiberator-compiled routine that only requires entering either the value of the Euros or any of the eleven local currencies in order to convert either way it runs fine under QPC and SMSQ/E. It even has a multi-tasking sleep mode that is toggled on/off by CTRL C.

This routine is included among the programs and listings that are on the bonus QL Today Cover Disk that comes with each final volume-issue of the newsletter, VOL. 3, No. 6 in this case. All the published listings, an annual index of articles, and several of the freeware programs reviewed during the preceding year are also on the 3½" floppy in zip-compressed files, as well as the UNZIP program.

The current Cover Disk includes an update (v.TUTK3c27) of the code module for TurboToolkit, along

with many demo plug-in procedures which utilize this toolkit. Also on the disk is a full version of Mark Knight's K-BASE (v.2.20), which utilizes Turbo Toolkit and was compiled under the Turbo compiler. This multi-tasking card-index style database program is designed principally for quick and easy access to records such as address lists, inventories, etc. and will store and process up to 32767 records. It has a comprehensive and clearly-written manual, stored in ASCII, and has received very positive reviews. It runs fine under QXL or QPC and SMSQ/E as well as Trump Card or Gold Card expansions of the QL.

A new upgrade of the Perfection wordprocessor is likely to be released as freeware, but beta-testing of it was not yet completed at the time the current Cover Disk was made up. one of the features of this version is that high resolution screens are used properly, so you may pre-configure large windows if you wish.

In other news, Richard Zidlicky, the author of uQLx emulator for Unix/Linux based machines, has ported Linux-68k to the newly-released Q40 (the hardware replacement for the QL, with a fast 68040 processor). This raises the interesting possibility that the Q40 itself might be able to run a QL emulator under Linux. Richard is now looking to have full Q40 support added to future releases of the Linux system. (Linux, so named in 1991 for a Finnish university student, Linus Torvalds, who has developed it from its roots in Unix to its present kernel version 2.2.0, runs on all major processors, and has become a formidable competitor to Microsoft Windows and NT.) (and is Free) This, in turn, may have the potential of creating a new market for the Q40 among Linux users that would enlarge its production base among them as well as providing QL users with a full-fledged platform for the powerful Linux OS. This would provide the best of both worlds, as well as further insurance of continued availability and improvement of QL hardware and software! Since the UK does not yet use the Euro, I wrote the following little SuperBasic routine that converts pounds to US dollars. The PRINT\_USING command to format the output requires that TK2 be activated, as is automatically done under QPC.

```
1 REMark QPC ED Listing As Displayed in
WTV Mode
```



```

10 CLS
20 PRINT "British pound £ to US $
conversion"
30 INPUT "\"Enter current $n.nnnn to £
rate: $";pr
40 INPUT "\"Currency in £s to convert:
£";np
50 PRINT "\"US dollars: ";:

```

```

PRINT_USING"$$$##.##",pr*np
60 PRINT "\"Any key to repeat - CTRL
SPACE to halt\"then RUN to change RATE"
70 PAUSE 1000
80 CLS
90 PRINT "Current $ to £ rate: $";pr
100 GO TO 40

```

## FROM THE CHAIRMAN'S DISK

Donald S. Lambert

**U**nder the column Article Contributions on page 2 there is a box in which it states that "Send in your articles by tape or disk and your inputs to me" that has to be changed. Sometime between this newsletter, Summer '99 and Fall '99, I will be down to one computer and that will be a Z88. By then I will have sent all my other computer equipment to Jack Boatwright. I don't really want to part with my 2068 BUT! wifely pressure and a move is forcing the issue. With that said I will continue with this column

**W**ay back when I bought a Z88 EPROM Eraser that requires an AC voltage of 220 volts. Someone responded with the information that a supplier had a 110 VAC to 220 VAC plug in transformer so I ordered it and it is a cute little thing. But before I got the transformer I had bought a power supply that had the ability to runoff of 110 VAC or 220 VAC. So I had converted it so that it supplied 220 VAC. But that thing was a heavy and big deal. While it is not according to electrical code, I had ran the 220 VAC to a standard type 110 VAC socket and put a standard 110 VAC plug on the line cord of the Z88 EPROM Eraser. Today as I was cleaning and sorting things I came across the EPROM Eraser and I dug out the step up transformer. I stared at the socket on the transformer and I noted that it was for a round U.K. type plug prongs. BUT then I noted that it had also the provision for the flat plugs like on the US 110 VAC line cords. Yep it fits I presume it works since I did not test it.

**I** thought that a 2068 on the other computer desk had gotten contrary but today while copying a 3.5 720K disk to DSDD 360K disk I discovered that drive 0 (full height 360K) drive must be bad since drive 3 (half height 360K) drive worked all right. That 2068 will be in the next box of TS goodies that I will ship to Jack I have a full box to send out as soon as I seal it up, put the shipping label on and take it to UPS for shipment

**N**ow the 'news' we have bought a house in Forsyth, IL. And where is Forsyth IL? I you take I-72 into Decatur, IL and exit going south you are in Decatur but if you exit going north your are in Forsyth. Decatur is not growing and housing is rather limited I think there are new houses but not located where it is easy to get to the shopping. BUT! the only enclosed mall and a lot of the stores for the area are in Forsyth. They are building all over in Forsyth. Our oldest daughter and family live in Decatur and are about 7 miles from where we are buying. There are grandchildren there and the youngest is in 7th grade going into 8th next year. Looking back we have averaged bout 10 years in a house since we started buying houses

**W**e went to Decatur to see the granddaughter in show choir of the intermediate school. It was a long performance since they put on all their competition stuff. We will be going back Memorial day weekend to attend the grandson's high school graduation party and also to meet with the builder on the 1st of June (our wedding anniversary, 48th) to pick out the flooring and such for the house. We picked out the siding colors and brick work and interior paint on May 4th and the kitchen cabinets May 5th. How did we find the house. Well, we were there the week end of April 23rd and we arrived early so we went driving around Forsyth and spotted this house with workers working on the roof putting on the sheathing. They invited us to take a look at the rough framing of the house and they gave us a set of blue prints. We sort of dallied along till I put the pressure on for my wife to make up her mind. So when I called on May 3rd to talk to the builder we found that the house was quite a few thousand less than we had been quoted as a possible price by the workers.

**T**he builder's brother was in another city 45 miles away talking to a prospective buyer and since the financing was too iffy for that party we had a verbal agreement to buy the house. After we had gotten the house on the evening of the 4th of May as I was relaxing they showed the tornado damage in Oklahoma. Yes! we will have a basement! I looked on the map and Gil Parrish is not too far east of that area I don't think he got any damage.

**I** realize that this is not too much about TSing but it will explain my lack of input and my address change. I have an address but I will hold that off to reconfirm it and find out more about the move with a tentative date of August 1st this year. Right now we are in the throes of getting the house here ready to sell and packing, sorting and disposing of extra stuff or no longer wanted stuff.

**I**t is about 310 miles one way and it seems longer especially with I-74 having a lot of construction west of Indianapolis to the IL border. 0/0

\* \* \*

The armed attack on that high school would not have happened if the other kids had been armed. When the gunmen attacked the classes all the other kids could have drawn their pocket protection and blown them away. This just reinforces the NRA's message that none of us are safe until everybody and that includes every single child is adequately armed.

\* \* \*

# Font Loader in HiSOFT Pascal<sup>©</sup>

Article and Program by David Solly

One of the attractions of the Timex/Sinclair 2068 is its ability to change its screen font through the use of user-defined fonts. As a programmer, you may want to change the display font a program uses for several reasons. A banking or financial program, for instance, would require that you use a font in which no one can possibly mistake a letter like "el" for the number one. To better set the mood of a game set the Middle Ages, you may wish to use a Gothic font. Likewise, a game set in outer space may require a futuristic looking font. Perhaps you want your T/S 2068 to display text in Greek or Russian. In that case, you have to change the entire character set as well as the font. (To the confusion of many, computer programmers and technical writers tend to use "font" to mean either a "font" or a "character set". Be aware that the program I am about to describe can be used to change both.)

Font loading and activation is much easier in HiSoft Pascal, (henceforth: Pascal), than in BASIC for the following reasons:

Firstly, you don't have to make any changes to RAM\_TOP. To prevent BASIC programs from overwriting a user defined font, the usual practice is to lower RAM\_TOP and load the font into the protected area created above. In Pascal, a global array  $\bar{y}$  which is also a static array  $\bar{y}$  is used to reserve space in RAM into which the font is loaded. Pascal keeps track of such arrays and prevents them from being overwritten by any of its operations.

Secondly, you don't have to worry about where in RAM the font file is loaded. The built-in function ADDR(v) can be used anywhere in a program to locate the start position of any variable the program uses. Even if you should make modifications to your source code which changes the location of a given variable within the compiled program, ADDR(v) will still be able to locate it.

Finally, you are relieved of doing and re-doing the calculations needed to determine which values to poke into the system variable CHARS to activate the new font. Once ADDR(v) has been used to locate the start of the variable being used to store the font, all your program is required to do is to invoke the POKE(l, n) procedure to transfer this value less 256 bytes to CHARS, thus: POKE(23606, ADDR(v)-256); and your new font becomes active.

There are already font creation programs aplenty written in BASIC. Most of them save the fonts they create as a byte file of 770 bytes. Below is a demonstration program written in Pascal that contains source code which will allow you to load and activate these fonts within a Pascal program.

```
PROGRAM FONTLOADER;
```

```
{  
  Special note to HiSoft Pascal 1.7M  
  users:
```

```
  This program must be compiled in 31  
  column mode.
```

```
}  
CONST  
  Chars = 23606;  
  {Chars holds the address of the  
  system  
  variable CHARS which in turn points  
  to  
  the location either in ROM or RAM  
  where  
  the current font is located.  
  The value stored in CHARS is always  
  256  
  bytes less than the actual start  
  location of the current font.}  
VAR  
  CharSet : ARRAY [0..770] OF CHAR;  
  {Reserve space in RAM for the new  
  character set}  
  {Remember: CHAR takes 1 byte,  
  INTEGER takes 2 bytes}  
  FileName : ARRAY [1..12] OF CHAR;  
  {An array for holding the file  
  name of the font to be loaded}  
  StartAddr, {To hold the start address  
  of the new font}  
  I          {A loop counter}  
  : INTEGER;  
  
BEGIN {MAIN PROGRAM}  
PAGE; {Clear the screen}  
WRITELN('What is the name');  
WRITELN('of the font to load?');  
WRITELN('(12 characters padded)');  
WRITELN;  
WRITE('> ');  
READLN; {Required in HS Pascal}  
READ(FileName);  
{Load in the font}  
TIN(FileName, ADDR(CharSet));  
StartAddr := ADDR(CharSet);  
  {Poke location of new font  
  into the system variable CHARS}  
POKE(Chars, StartAddr - 256);  
  {Print the new font from space to  
  UDG-U}  
FOR I := 32 TO 164 DO  
BEGIN  
  WRITE(CHR(I), ' ');  
END;  
  
WRITELN; WRITELN;  
{Add font save code here if required}  
WRITELN('End of test');  
END.
```

## **A special note for ZX Microdrive users:**

For some reason this Pascal font loader will only load fonts that have been saved on tape. Trying to load font file which has been saved to the Microdrive from BASIC will

generate an "invalid file format" error report. If you wish to use the Microdrive to load in a new font, you can, but first you must create a special kind of font file from within a Pascal program for each font and save it on the Microdrive.

First, add the following lines to the source code in the spot indicated in the main program and resave. Then recompile and save the new font loader/saver program.

```
{Save font routine}
WRITELN('Enter a name to save');
WRITELN('the font to the
microdrive?');
WRITELN('(12 characters padded)');
WRITELN;
WRITE('> ');
READLN; {Required in HS Pascal}
READ(FileName);
  {Save the font}
TOUT(FileName, ADDR(CharSet),
SIZE(CharSet));
```

Next, if you do not have your character sets saved on tape already then using BASIC you will have to load in each font from the Microdrive in and resave it on tape. (I trust that you all know how to do this.)

Once you have your font files saved on tape then you can use the Pascal font loader/saver program to load them back from tape and save them out y and here I would strongly suggest using a new cartridge y to the Microdrive. Now you character sets are ready for you any time you wish to use them in a Pascal program.

The source code for this program is available upon request by sending e-mail to David Solly at [ac355@ncf.ca](mailto:ac355@ncf.ca). Source code is saved as an \*.MDX file which is compatible with Gerton Lunter's Z80 ZX Spectrum emulator

## West Coast Sinclair Show

*by Tim Swenson, the show organizer*

The West Coast Sinclair Show was held in Union City, CA, on 5 June 1999, one week after the East Coast Sinclair Show. Most of the European attendees arrived the Monday before the show and spent the week visiting San Francisco.

The day before the show was by Bar-B-Q at my house. Before the show a trip was made to a local regional park to show the Europeans a little bit of California nature. Luckily the side trip was enjoyed by all.

The attendees at the Bar-B-Q were: Simon Goodwin and his girlfriend Chris Lyle, Tony Firshman, Roy Wood, Jochen Merz, Marcel Kilgus, Dietrich and Inga Bruder, Jim Hunkins, Don Waltermann, John Rish and Jack Boatwright. As evening fell, Simon, Chris, Tony, Marcel, and I hopped in the Hot Tub for a bit of a soak.

The day of the show I loaded up the station wagon QL stuff, picked up a few folks at the local Motel and headed for the venue.

As this was the first show I've organized, I was not too sure on how big a place to get. The venue as, shall we say, nice and cozy. There was enough room for the vendors, but not really enough for a lot of milling about.

The vendors were - Tony Firshman with his ever present QL controlled LEGO robot, Roy Wood demoing software on a Q40. Jochen Merz and Marcel sharing a table with their wares. Jack Boatwright was selling the last of the stuff from RMG. John Rish (the sole US QL, Z88 dealer) had mostly Z88 stuff on his table. Don Waltermann had a Spectrum 128 set up for all to see. Simon Goodwin tinkering on a QL (one of two) that had been given as

## BEATING THE HIGH PRICE OF PRINTER INK

*Editor*

So you got a good deal on that ink-jet printer only to find out later that the cost of buying new cartridges is breaking the bank. Each cartridge costing between \$18 to \$34 and producing at most 300 pages. It is easy to spend more on ink during your first year of ownership than you paid for the printer itself. Suddenly that \$99.95 ~ \$149.95 color ink jet doesn't look like such a great bargain.

You can slash the ink cost radically by purchasing refill kits from various suppliers who sell those kits for various ink-jet (bubble-jet) printers like Cannon, Epson, HP, Lexmark etc... for around \$27 per ink bottle that is good for 14 re-fills in my case.

My kit included 8 oz. of ink, a syringe and a little hand drill with directions. You poke a hole in the cartridge with the little drill, then using the syringe, you inject the water soluble ink into the cartridge - doing that over the sink or a newspaper - just in case!!! It is almost like getting ink for free.

Voila! you are back in business for a fraction of a penny per page.

Nu-Kote International

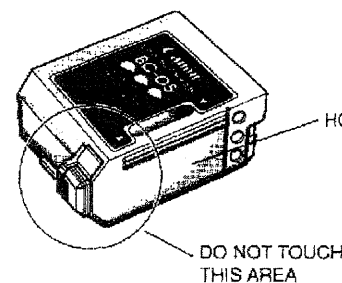
800 448-1422 [www.nukote.com](http://www.nukote.com)

Renewable Resources

800 734-6548 [www.renewableresources.com](http://www.renewableresources.com)

Repeat-O-Type

800 228-3330 [www.repeatotype.com](http://www.repeatotype.com)



orphans looking for a new home, by a QLer who had upgraded to Mac.

Ken Harbit drove from Fresno to pick up some T/S 2068 stuff and went home with one of the orphaned QLs. Bill Miller and Terry Greenlee (formerly of the Peninsula QL Group) made a surprise visit to the show.

The key visitor to the show was the renowned author Stan Kelly-Bootle, writer of many computer books, including the "Devil's DP Dictionary", and the holder of the first post-graduate degree in Computer Science (from Oxford).

Simon Goodwin has been a reader of Stan's work for a number of years (so have I) and considers him one of the few that have really mastered the English language. When I mentioned to Simon that Stan was coming to the Show, Simon's jaw literally dropped. Simon got to spend a few hours chatting with Stan, smiling the whole time.

There was no organized demonstrations or talks, just a whole lot of Sinclair talk going on. Since I was the organizer, I was not really relaxed enough to truly enjoy the show.

When the show ended at 5:00, there was a debate on where to have dinner held. Originally, Tony and Roy were leaving for the Airport right after the show. Unknown to me, their flight was delayed 4 hours and they had time for dinner after the show. Luckily everyone agreed on a place for dinner and the restaurant easily handled a group of 13.

We are talking about plans for next year. We have just discovered a local "Vintage Computer Show" that would be the right audience to advertise our show. Hopefully we can generate more local attendees next year.



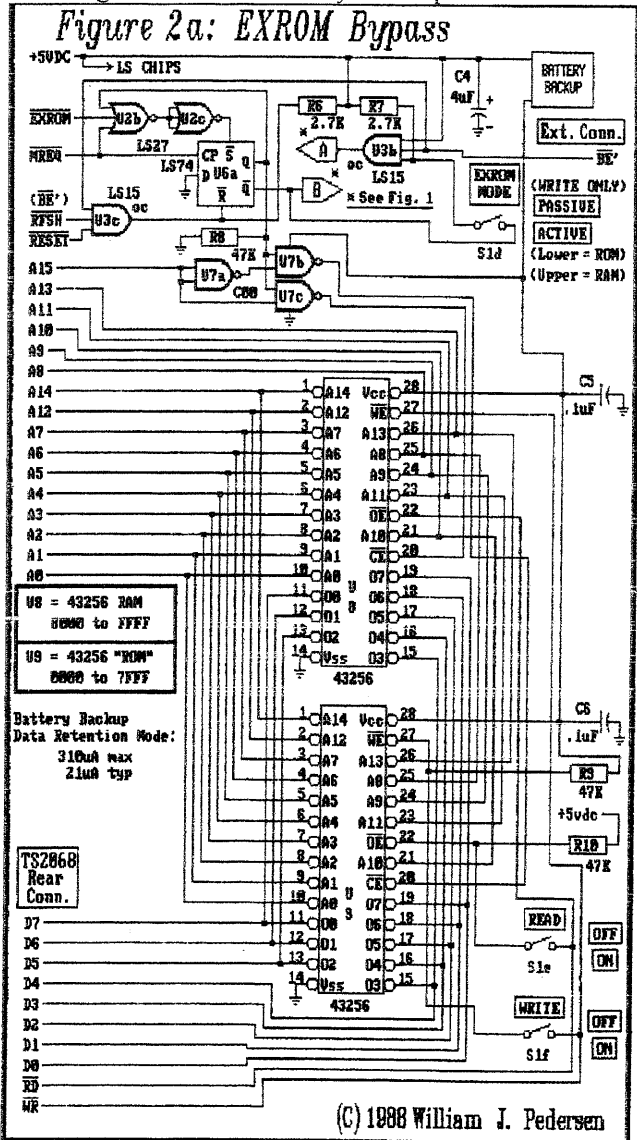


3. ROSCS is low (DOCK bank addressed),
  4. MREQ is high (NOP, I/O or INTERRUPT CYCLE),
  5. BE is low (Expansion bank active),
  6. RD is high (Write cycle in process) or
  7. RPSH is low (Applies to some static RAM).
- What logic could be easier to implement?

Before attempting operating system revisions, a copy of existing code can be used in the bypass. This is an excellent test of bypass circuitry. No change in operation should be detectable when a bypass card is present, or absent.

### EXROM Replacement

EXROM presents an interesting problem. It is enabled by the EXROM signal (not BANK #254), but lack of complete internal address decoding results in false images occurring in all other chunks, not just CHUNK #0. If we had an expansion BANK #254, it would have higher priority than the internal chip -- but that requires a bank switching controller and usually a back-plane.

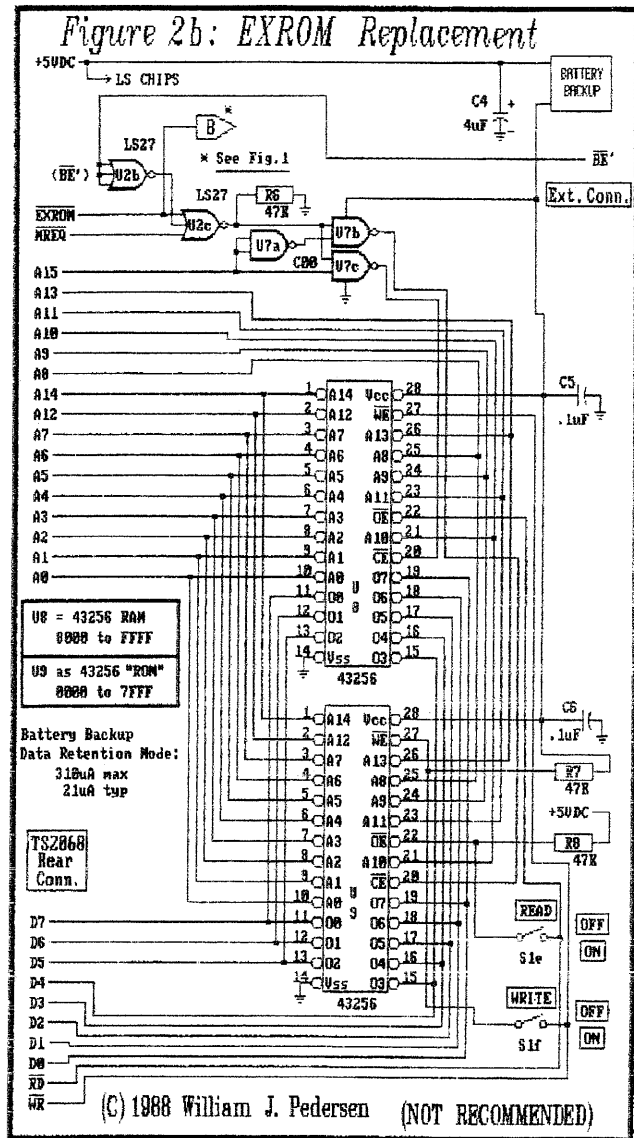


The simple solution is to physically remove the EXROM chip from inside and remount it with full address decoding on a board. Though it is necessary to open the case, no wiring changes are needed and the chip can always be put back.

A tremendous advantage is gained when this is done.

The false images are gone, making seven CHUNKS of EXROM available for use as either RAM or EPROM as desired. Again, this can be tested for no change in operation before and after the change.

Figure 2b is a practical variant of this which allows updating.



### EXROM Bypass

Lacking a bank switching controller, it would seem impossible to use the BE signal to disable the internal EXROM chip and still have an external bypass take over. The presence of the EXROM signal from the SCLD would try to cancel itself, resulting in oscillation.

If the initial presence of EXROM signal can be latched on the bypass board, and then BE is switched low, this can be avoided.

**Now we have a way to leave those screws untouched.**

We need to reset the latch before the next instruction comes along, when an external bank exerts priority, at power-up and REFRESH.

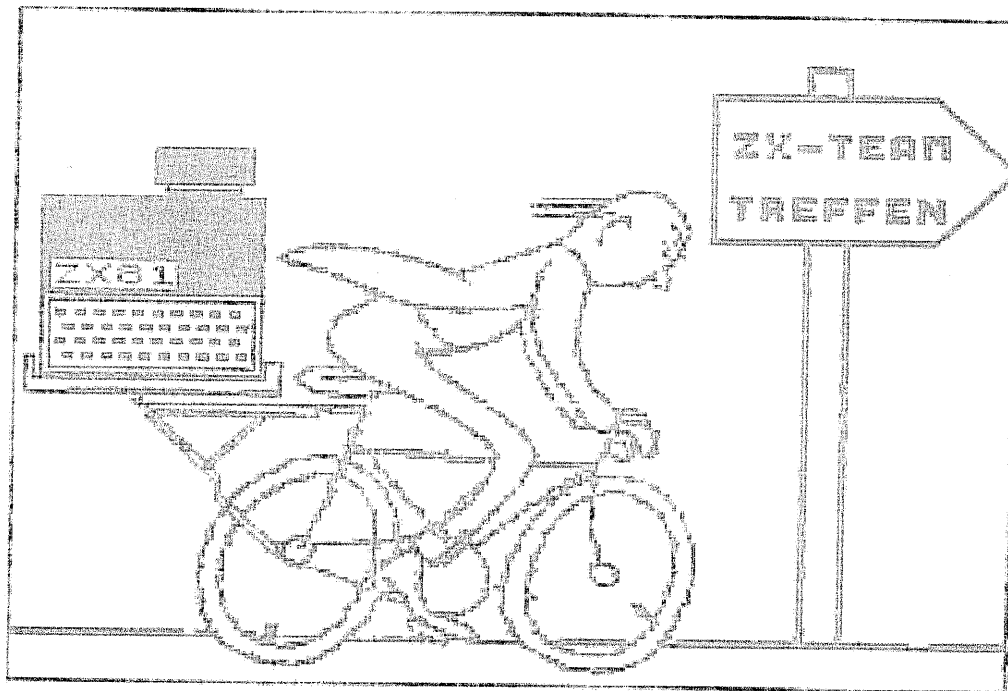
The extra cost of a safe approach might make the risk in removing the EXROM chip seem worth while. That is what Figure 2b is for.

This is **not recommended** unless you are a confirmed hacker!



Dieter Thomas Herbert Stefan Joachim Gotthard Peter Ludwig Uwe Gernot  
 Philip Kai Nickel Georg Henning Michael Bodo Eckhard Thomas

Z  
 X  
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 T  
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 M



**For our english readers:**

The third ZX-TEAM-meeting 26-28 march in Dietges was a great success: we had 32 participants, 21 of them stayed over night! In our "exhibition" a lot of ZX projects could be demonstrated. All new and a big lot of some elder of our developements could be seen in action.

Hard-disk controller with MEFISDOS, LCD-screen, hand-scanner, ZX-CAD and much much more. The ZX81-mailbox demonstration from Gernot was a great success! New projects have been discussed like a SMD-ZX or the Jupiter-Ace project.

On the fleamarket everyone could find some good bargains!

For more information and some photos please look at ZX-TEAM-homepage, meetings-pages: <http://home.t-online.de/home/p.liebert/zx-team.htm>

If you would have liked to participate, please do not be too sad: the next great ZX-TEAM-meeting will be in spring 2000. You are welcome!!!!!!!!!!!!!!

[peter@zx81.de](mailto:peter@zx81.de)

# How to Hack on The ZX Spectrum *Les Cottrell*

## Part 6 – cont.

```
CC94 3E C3      LD A,#C3
CC96 32 32 5B   LD (#5B32),A
CC99 21 A1 CC   LD HL,CCA1
CC9B 22 33 5B   LD (#5B33),HL
CC9E C3 00 5B   JP #5B00
```

This puts the instruction JP #CCA1 at #5B32 so the loader decrypter will return to our hack at #CCA1 when finished.

```
CCA1 21 B2 CC   LD HL,#CCB2
CCA4 11 D5 5B   LD DE,#5BD5
CCA7 01 08 00   LD BC,#0008
CCAA ED B0     LDIR
```

This copies the final part of our hacking routine to #5BD5, where it will be executed once the whole game has been loaded.

```
CCAC 21 00 00   LD HL,#0000
CCAF C3 35 5B   JP #5B35
```

The LD HL,#0000 instruction is important, because it's the instruction we overwrote with out JP back to the hack.

Therefore, we've got to execute it, otherwise the loading system may crash. Then it resumes loading at #5B35 with the POKEs firmly in place.

```
CCB2 3E B6      LD A,#B6
CCB4 32 5F AB   LD (#AB5F),A
CCB7 C3 BC F5   JP #F5BC
```

This is the hacking routine which will be copied into the loading system. AB5F,B6 is the POKE for infinite lives (which can be worked out by a forwards or a backwards trace), and JP #F5BC jumps to the game.

And that's about it for Bleepload! Hopefully, if you were hacking a different game, you still managed to do it (they're all virtually identical anyway).

### ULTIMATE LOADER

Remember Ultimate? They were one of the finest software houses of all time. Most of their games from 1983 to 1987 had the same type of loader (but a few were Speedlocked - more about them later). On the face of it, it just looks like a totally unprotected BASIC loader, but the appearance is deceptive. The five blocks it loads are the loading screen, the game itself, a decrypter at #5B80, and two very short blocks of system variables. The system variables are, in actual fact the BASIC clock, and determine how many 50ths of a second the computer has been switched on for. The decrypter works using this system variable. The upshot of all this is that if you stop the program for even 1/50th of a second, you'll mess up the decrypter. You can get round this with a Multiface by loading in the first three blocks of code, then replacing the code at #5B80 with #F3,#18 and #FE. This disables interrupts, so the system variable doesn't get updated, and causes an endless loop. Load in the last two blocks, activate the Multiface, and find out what the system variable should be. Then you can put this into the decrypter automatically.

### MIKRO-GEN LOADER

This loading system appeared on just about every game released by the software house Mikro-Gen (oddly enough!) from about mid-84 to their demise in 1987. They come in two varieties, and you'll need a Multiface to hack

some of the later ones, unfortunately.

The first type are recognized by black and white loading stripes, which loads in a screen block, and then the main game block separately. I'll be doing Pyjamarama as an example, but any Mikro Gen game which fits the above description will do.

So the first thing to do is to \*Hack the BASIC loader.

```
PYJAMARAMA LINE 0 LEN 504
0 BORDER 7:PAPER 7:INK 0:BRIGHT
0:FLASH 0:CLS:PRINT AT
12,12;"LOADING":RANDOMIZE USR (PEEK
23627+256*PEEK 23628+6)
20 POKE 23756,0:POKE 23757,0:SAVE
"PYJAMARAMA" LINE 0:RANDOMIZE
USR 33040
```

The BASIC loader actually features much more than what we can list. If you're old enough to remember the ZX-81, you'll recall that the best place to put a machine code program is in a REM statement. And that's almost the case here, except the machine code comes after the ASCII code #0D (NEWLINE), so you can't list it. But it's there. It's activated by the RANDOMIZE USR command. Type PRINT (PEEK 23627+256\*PEEK 23628+6) and you'll find out the start address of the code. I made it 23984, which is 5DB0 hex (but you might find it to be something different), so disassemble this address.

```
5DB0 F3 DI
5DB1 31 00 00 LD SP,#0000
5DB4 2A 4B 5C LD HL, (#5C4B)
5DB7 11 1C 00 LD DE,#001C
5DBA 19 ADD HL,DE
5DBB 11 16 80 LD DE,8016
5DBE 01 E7 00 LD BC,00E7
5DC1 ED B0 LDIR
5DC3 C3 16 80 JP 8016
```

Hopefully the DI and the LD SP,#0000 should be familiar. The next line loads HL with the two byte value starting at 5C4B. I made it 5DAA. This then has 1C added onto it, making it 5DC6. The rest of the code is a simple LDIR command, which puts the loading system to where it should be.

In our hack, we can simply use a headerless loader to load the code into place. We know that 5DC6 goes to 8016. BASIC always starts at the value in #5C53, which is #5CCB in this case. We know that the length is 504, or #1F8 hex bytes long, and the start address is (#5CCB-#5DC6)+8016 = #7F1B. So, run the following routine.

```
5B00 DD 21 1B 7F LD IX,#7F1B
5B04 11 F8 01 LD DE,#01F8
5B07 3E FF LD A,#FF
5B09 37 SCF
5B0A CD 56 05 CALL #0556
5B0D 30 F1 JR NC,#5B00
5B0F C9 RET
```

I've put a JR NC,#5B00 in, so that the computer ignores the BASIC header, and will only return on loading the main BASIC block. You should also note, that in the final hack, we'll have to add a DI and a LD SP,#0000 sometime. For now, disassemble #8016

```
8016 DD 21 00 40 LD IX,#4000
```

```
801A 11 01 1B LD DE, #1B01
801D CD 4F 80 CALL #804F
```

This code activates the turboloader, which loads in the title screen.

```
8020 21 00 40 LD HL, #4000
8023 01 00 1B LD BC, #1B00
8026 CD 3F 80 CALL #803F
```

This code verifies that the screen has loaded in properly (the routine at #803F adds up all the memory with start HL and length BC, and compares it with the byte after this block), and resets the computer if it hasn't.

```
8029 DD 21 00 82 LD IX, #8200
802D 11 A0 7A LD DE, #7AA0
8030 CD 4F 80 CALL #804F
8033 21 00 82 LD HL, #8200
8036 01 9F 7A LD BC, #7A9F
8039 CD 3F 80 CALL #803F
```

This is exactly the same as with the previous code, except it loads and checks the main game instead of the loading screen.

```
803C C3 89 FC JP #FC89
```

Put a breakpoint over this instruction. Now POKE #8012 with F3, #8013 with #31, #8014 with #00 and #8015 with #00 (because we didn't execute the DI:LD SP,#0000 from the BASIC loader, and the game will not load otherwise), JP #8012 and start the tape. When the main game's loaded, disassemble #FC89.

```
FC89 21 EF B4 LD HL, #B4EF
FC8C 11 00 40 LD DE, #4000
FC8F 01 00 1B LD BC, #1B00
FC92 1A LD A, (DE)
FC93 AE XOR (HL)
FC94 77 LD (HL), A
FC95 23 INC HL
FC96 13 INC DE
FC97 0B DEC BC
FC98 78 LD A, B
FC99 B1 OR C
FC9A 20 F6 JR NZ, #FC92
FC9C C3 EA BE JP #BEEA
```

This decrypter uses values in the screen memory, so you'll have to put a breakpoint at FC9C, put a JP #FC89 at #8029, JP to #8012 and reload the loading screen before you can run it. Then disassemble #BEEA.

```
BEEA 31 00 00 LD SP, #0000
BEED CD CC BE CALL #BECC
BEF0 C3 00 82 JP #8200
```

This code puts the stack pointer back at #0000, CALLs another decrypter, and JPs to #8200, which is the start of the game. Change the #8200 to a suitable place to put POKEs; finish them with a JP #8200 to start the game. Here's the final hack, and I've put it at #5B00, because it doesn't get overloaded, apart from the byte at #5B00 itself, which is no longer needed by that time. Also, I've executed the DI:LD SP,#0000 directly, as well as the code from BEEA to BEF2.

```
5B00 DD 21 1B 7F LD IX, #7F1B
5B04 11 F8 01 LD DE, #01F8
5B07 3E FF LD A, #FF
5B09 37 SCF
5B0A CD 56 05 CALL #0556
5B0D 30 F1 JR NC, #5B00
5B0F 21 1C 5B LD HL, #5B1C
5B12 22 3D 80 LD (#803D), HL
```

```
5B15 F3 DI
5B16 31 00 00 LD SP, #0000
5B19 C3 16 80 JP #8016
5B1C 21 25 5B LD HL, #5B25
5B1F 22 9D FC LD (#FC9D), HL
5B22 C3 89 FC JP #FC89
5B25 31 00 00 LD SP, #0000
5B28 CD CC BE CALL #BECC
5B2B AF XOR A
5B2C 32 ?? ?? LD (????), A
5B2F C3 00 82 JP #8200
```

The other type of Mikro Gen loader is almost identical, except the whole game loads in one long block. Then end of the BASIC loading system is missing to start with, and is only loaded right at the end of the main headerless block. You can find out the missing code by loading the game as normal, then stopping it with a Multiface in the pause between the game loading, and the game starting (approx. 3 seconds), and hack it in the same way as Pyjamarama.

### POWERLOAD

This protection system appeared first around the start of 1984, and was written by "Tag" (Phil Taglione) for Incentive Software. However, it's been used by quite a lot of other software companies as well, including Beyond, Mirrorsoft, Prism and Ariolasoft. It can be recognized by the screen turning black, accompanied by a few ascending beeps. It then loads one short headerless block, and then a longer headerless block, which includes the attribute file for the game coming up "backwards" i.e.: right to left, starting from the bottom. The game also stops loading just before the end of the long headerless block.

The only thing I know of that YS have put on the covertape that has Powerload is the Graphic Adventure Creator, but that's pointless hacking, so instead I'll be hacking Dynamite Dan. Of course, most other Powerload games are identical apart from some addresses, and, in fact, the BASIC loaders are all identical.

Before we start, I need to explain a little more about the stack, because Powerload uses it a lot. There are four commands which use the stack, and they are:

PUSH X (where X is any register) this takes the value in a register, and puts it onto the stack. The stack pointer then decreases by two (to be in the right place to store another value).

POP X

this takes the two byte value at the stack pointer (i.e.: the top of the stack), and puts them in a register. This also increases the stack pointer by two.

CALL XXXX

when you CALL a subroutine, the return address (i.e.: the address after the call) is PUSHed onto the stack, and the subroutine is JPed to. The stack pointer also decreases by two.

RET

when a RET instruction occurs, the computer takes the value on the top of the stack, and JPs to it. The stack pointer increases by two.

Now we've cleared that up, let's start hacking. \*Hack the BASIC as usual.

```
D.D. LINE 0 LEN 496
0 REM
```

```

10 CLEAR 59999:POKE 23693,0:POKE
23624,0:POKE 23697,0:CLS:POKE
23659,0:FOR N=30 TO 36:BEEP
.075,N:NEXT N:RANDOMIZE USR
24146:RANDOMIZE USR 0
100 REM

```

The POKEs in line 10 just make the screen black and prevent you from pressing break. 24146 is #5E52 hex; but a breakpoint at #5E52 and GOTO 0. This is because the stack is set up in a specific way by the BASIC commands.

```

5E52 F3 DI
5E53 21 00 00 LD HL,#0000
5E56 39 ADD HL,SP
5E57 22 F2 5D LD (#5DF2),HL

```

This code simply puts the value of the stack pointer into address #5DF2, so it can be retrieved later.

```

5E5A 31 95 5E LD SP,#5E95
5E5D 26 5E LD H,#5E
5E5F E5 PUSH HL
5E60 21 68 5E LD HL,#5E68
5E63 E9 JP (HL)
5E68 3E 12 LD A,#12
5E6A 32 93 53 LD (#5E93),A
5E6D E1 POP HL
5E6E E5 PUSH HL
5E6F D1 POP DE
5E70 C9 RET

```

Put a breakpoint at 5E70 and JP to 5E52. At 5E70, the value on the top of the stack is #5E76, so a RET will JP to there.

```

5E76 C1 POP BC
5E77 7E LD A,(HL)
5E78 ED 44 NEG
5E7A 77 LD (HL),A
5E7B 23 INC HL
5E7C 10 F9 DJNZ #5E77

```

This code is, as you might realise, a decrypter. The start value of HL is #5E12, and the initial value of B is #3A. In case you're interested, the NEG instruction turns the value in the A register into its negative form; in other words, the value in A is subtracted from #100 hex. Put a breakpoint at #5E7E and JP #5E70 which is where we left off).

```

5E7E E1 POP HL
5E7F 22 78 5E LD (#5E78),HL
5E82 C1 POP BC
5E83 3E C9 LD A,#C9
5E85 32 7E 5E LD (#5E7E),A
5E88 3E 00 LD A,#00
5E8A 32 7A 5E LD (#5E7A),A
5E8D 5D PUSH DE
5E8E E1 POP HL
5E8F C9 RET

```

This code changes the previous decrypter slightly, and RETs to 5E77. Put a breakpoint at 5E8F and JP #5E7E.

```

5E77 7E LD A,(HL)
5E78 ED 67 RRD
5E7A 00 NOP
5E7B 23 INC HL
5E7C 10 F9 DJNZ,#5E77
5E7E C9 RET

```

This code works with the same values as the previous one; HL=5E12 and B=3A. It then RETs to 5E12. Put a breakpoint at #5E7E, and JP #5E8F (where we left off last time).

```

5E12 21 B4 5F LD HL,#5FB4
5E15 11 B5 5F LD DE,#5FB5
5E18 01 B8 88 LD BC,#88B8
5E1B ED B0 LDIR
5E1D E1 POP HL
5E1E 54 LD D,H
5E1F 5D LD E,L
5E20 1C INC E
5E21 C1 POP BC
5E22 ED B0 LDIR

```

These two LDIR commands wipe all the memory that isn't being used by the loading system. To get round this, you should change #5E1B, #5E1C, #5E22 and #5E23 to #00, to stop them being executed. Put a breakpoint at #5E24 and JP #5E7E (where we left off).

```

5E24 06 1E LD B,#1E
5E26 E1 POP HL
5E27 7E LD A,(HL)
5E28 EE A3 XOR #A3
5E2A 77 LD (HL),A
5E2B 23 NC HL
5E2C 10 F9 DJNZ,5E27

```

The value in HL for this decrypter is #5E2E, which is right after the decrypter. To crack it, therefore, move the code from #5E24 to #5E2D somewhere safe (such as #5B00), put a breakpoint on the end, and run the code from there. When that's done, put a breakpoint at #5E2E and JP to #5E2E (so that you're back in the right place in the loading system).

Carrying on with the loader...

```

5E2E E1 POP HL
5E2F 22 02 5E LD (#5E02),HL
5E32 E1 POP HL
5E33 22 05 5E LD (#5E05),HL
5E36 37 SCF
5E37 3E 07 LD A,#07
5E39 CD 00 5E CALL #5E00

```

This code takes some values off the stack, and puts them into the subroutine at #5E00, which is then CALLED. Put a breakpoint at #5E39 and JP to #5E2E.

```

5E00 DD 21 40 9C LD IX,#9C40
5E04 11 90 1 LD DE,#190
5E07 14 INC D
5E08 08 EX AF,AF'
5E09 15 DEC D
5E0A 3E 0F LD A,#0F
5E0C DB FE OUT (#FE),A
5E0E CD 62 05 CALL #0562
5E11 C9 RET

```

This routine is a headerless loader. The start is #9C40 and the length is #190. Also the value of A is 7, and the carry flag has been set. In effect, we could have used a standard CALL #0556 headerless loader. Put a breakpoint at #5E3C and JP to #5E39. Start the tape and load in the first short headerless block. Then continue disassembling.

```

5E3C D2 01 00 JP NC,#0001

```

This code resets the computer if there was a loading error from the first headerless block.

```

5E3F 21 40 9C LD HL,#9C40
5E42 06 FF LD B,#FF
5E44 CD 77 5E CALL #5E77
5E47 06 FF LD B,#FF
5E49 CD 77 5E CALL #5E77 (to be continued)

```



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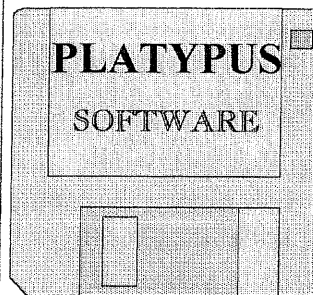
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